and the right to a table in 1891, was secured to Americans, only through the private benefaction of Major Alex. Henry Davis, of Syracuse. For the year 1892 the use of a table has been secured through a subscription started by the American Association for the Advancement of Science, toward which the Association itself granted out of its scanty funds 100 dols. and was the means, I believe, of procuring the rest.[1]

We have not, however, been wholly without some such means of study in this country through the marine biological laboratories established some years ago at Newport and at Wood's Holl, by Prof. Alex. Agassiz. The former has been now enlarged so as to accommodate eight advanced students, besides the professor and his assistant.[2] The Johns Hopkins University also has supplied some opportunities of this kind by its summer school, formerly at Beaufort; later, at Jamaica; but at present, as I understand, it is without any permanent location.

Our neighbour, the Brooklyn Institute, has organised similar investigations, on a minor scale, during the summer months at different places on Long Island. But what is needed for the most effective work is suitable endowments for professors and advanced students, in connection with an adequate biological laboratory, such as the Newport one enlarged might afford, equal in means and equipment to that at Naples, or at least to that recently completed, largely through private enterprise, at Plymouth, England.[3]

(*To be continued.*)

SCIENTIFIC SERIALS.

Bulletin de l'Académie Royale de Belgique, Nos. 9 and 10.—On the conversion of black mercuric sulphide into red sulphide, and on the density and specific heat of these bodies, by W. Spring. As a general rule, if a body is capable of existing in two allotropic states with different densities, it is possible to convert the lighter into the heavier kind by compressing it to the higher density, the pressure depending upon its compressibility. Sometimes this conversion is only possible above a certain "critical temperature." In the case of the sulphide of mercury the conversion of the black into the red variety (vermilion) involves a compression of 9 per cent., and would require a pressure of 35.000 atmospheres, which is not at present attainable. But M. Spring has succeeded in obtaining a new form of black HgS which only requires 2500 atmospheres. It is obtained by sublimation of ordinary black HgS in an atmosphere of nitrogen or CO_2. Its density is 8·0395, while that of vermilion is 8·1587, and of ordinary black HgS 7·6242. A curious side result of the investigation is that the black sulphide hitherto known, after being made to expand by heat and then cooled, takes about a day to return to its original density.—Vapour tension and hygrometric state, by Dr. J. Verschaffelt. A new hygrometer may be based upon the fact that the hygrometric state of the atmosphere may be taken as the ratio of the vapour tension inside a solution to the highest possible vapour tension of water at the same temperature, if the tension inside the solution is equal to that in the atmosphere, *i.e.* when the solution does not evaporate or gather moisture from the air. The ratio mentioned is independent of the temperature, and hence the humidity is simply a function of the concentration of the solution. In practice, Dr. Verschaffelt moistens a weighed piece of blotting-paper with a weighed quantity of a solution of lithium chloride of known concentration, exposes it to the atmosphere, and weighs it again. From the last weight the "equilibrium concentration" may be calculated, and from this the humidity with the aid of Dieterici's data for this salt. The apparatus might be made self-registering.

Bulletin of the American Mathematical Society, vol. i. No. 2. (New York, Macmillan, November, 1894.)—On the problem of the minimum sum of the distances of a point from given points, is the translation, by A. Ziwet, of a paper presented to the Society at its summer meeting (August 15), by Prof. V. Schlegel (pp. 33-52). This frequently discussed problem (see references given by Sturm, *Crelle's Journal*, vol. 97), is considered by the author to offer room for further treatment. He discusses the best method of investigating the question, and in the end treats it by means of the simplest methods of Grassmann's "Ausdehnungslehre." Prof. Cajori collects a number of authorities in confirmation of a statement in his "History of Mathematics" (p. 218), that it is *not* true that the binomial theorem is engraved on Newton's monument in Westminster Abbey. The latest additional authority for his statement is contained in a letter from the present Dean of Westminster, whom Prof. Cajori calls "Dr. Granville"!—The only other matters are the notes and new publications.

SOCIETIES AND ACADEMIES.

CAMBRIDGE.

Philosophical Society, November 26. — Prof. J. J. Thomson, President, in the chair.—On Benham's artificial spectrum, by Prof. G. D. Liveing. Prof. Liveing exhibited one of Benham's "artificial spectrum tops" (see NATURE, November 29, p. 113), and a variety of discs with figures in black disposed on a white ground, and with white figures on a black ground, which, when revolved in a bright light showed remarkable bands of colour of various shades of red, green, and blue. The general result of his observations of these discs was that if a succession of black and white objects were presented to the eye with moderate, but not too great, rapidity, then, when black was followed by white, an impression of a more or less red colour was perceived, while when white was succeeded by black a more or less blue colour was perceived. If the succession of black and white was very rapid the appearance presented to the eye was of a more or less neutral green or drab. The explanation offered by Prof. Liveing was based on the known facts that the impression produced on the retina by a bright object remained for an appreciable time after the light from the object had been cut off, and that the duration of that impression was different for different colours; and on a supposition, which he did not know to have been as yet verified experimentally, that the rapidity with which the eye perceives colours was greater for one end of the spectrum than for the other. From this point of view the explanation of the blue colour seen when white is followed by black would be that the impression of blue on the retina lasts a little longer than that of the other colours; while the red colour seen when white succeeds black is due to the greater rapidity with which the eye perceives red light than that with which it perceives blue. If, however, the alternations of white and black succeed each other with sufficient rapidity, the new impression of a white patch will be produced before that of its predecessor has vanished, and there will be an overlapping of impressions, and the sensation will be that of a mixture of colours, or of a more or less neutral tint. So far as he could test the theory by his own eyes it appeared to him that the residual impression, left when the light from a white object was suddenly cut off, was at first green and faded out through a more or less blue or slate colour.—On a simple test case of Maxwell's law of partition of energy, by Mr. G. H. Bryan.

PARIS.

Academy of Sciences, December 3.—M. Lœwy in the chair.—The reduction of alumina by carbon, by M. Henri Moissan. The author describes the reduction of pure corundum by means of his now well-known electric furnace. Liquid alumina is not reduced by carbon; the reduction only takes place when the vapours of these substances are carried to a very high temperature, metallic aluminium is then produced and partially combines with carbon.—Reply to M. Mayer-Aymar concerning his defence of *Saharien* as a name for the latest geological period, by M. A. Pomel.—A letter from Prof. R. Fresenius was read announcing the formation of a German committee in connection with the Lavoisier monument. The Academy appointed Prof. Fresenius delegate for this work. Prof. G. Hinrichs was similarly appointed delegate for the

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[1] See *Proceedings American Association A. S.* 1891, vol. xl. p. 449-451.

[2] *Report Harvard College*, 1891, p. 182.

[3] In his address before the American Association for the Advancement of Science, in 1891, President Prescott, referring to this general subject, said: "To nurture investigation in science is the largest opportunity before the American people. Research, systematic and wisely directed, requires good organisation and strong support, the support of many powers. It must have the support of able and persistent men. It needs the conference of workers, and the dissemination of knowledge in societies like this. It wants the interest and the confidence of the public. It asks and will always obtain the constant, helpful use of the press. It requires distinct provision in colleges, and in the institutions of higher education. It ought to be sustained expressly by the Government, both in the several States and under the United States, and sustained on broad and permanent foundations. Still, it needs private benefactions. Research is the growth of years. Let it be the demand of all, and let this call find utterance everywhere."—*Proceedings American Association*, 1891, vol. xl. p. 440.

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United States.—On the identity of the new comet with De Vico's comet, by M. L. Schulhof (see our Astronomical Column, December 6, p. 132).—Observations of the planet B H 1894, discovered by M. Borrelly at Marseilles Observatory, November 19, 1894; by M. Borrelly.—On the distribution of planets between Mars and Jupiter, by M. E. Roger. A mathematical paper in continuation of a paper on the same subject in the previous number.—On quasi alternate permutations, by M. Désiré André.—On the temperature of the electric arc, by M. J. Violle. The conclusion is drawn, from a spectroscopic study of the poles and the arc itself, that the temperature of the arc is generally higher than that of the positive carbon, and that it increases with the electric energy employed.—On the solubility of ozone, by M. l'Abbé Mailfert. At a pressure of 76 mm. water dissolves two-thirds of its volume of ozone at 0° C., at 12° about one-half. The solubility of ozone in water acidified with sulphuric acid is the same as its solubility in pure water up to about 20° C.; more ozone is dissolved by the acid solution above this temperature. The suggestion is made that ozonised water might be employed as a disinfectant and antiseptic.—On the superposition of the optical effects of different asymmetric carbon atoms in the same active molecule, by MM. Ph. A. Guye and M. Gautier. For the determination of this point the authors have used in the present instance amyl valerate. The ester produced by combining inactive amyl alcohol with active valeric acid gives $[\alpha]_D = +1{\cdot}08^\circ$, the corresponding compound with active amyl alcohol and inactive valeric acid gives $[\alpha]_D = +4{\cdot}26^\circ$; the ester obtained from active alcohol and active acid gives $[\alpha]_D = +5{\cdot}32^\circ$, while the sum of the two former is $+5{\cdot}34^\circ$. Theoretically a better agreement should be obtained by using the racemic in place of the inactive forms; in this case the sum is $5{\cdot}62^\circ$. The difference is probably due merely to experimental errors.—Experimental researches on the crystallisation point of some organic substances, by M. Raoul Pictet. The crystallisation points of a number of organic substances are given, and the results are embodied in a number of general conclusions confirming previous work.—On the emission of a saccharine liquid by the green parts of the orange-tree, by Dr. M. Büsgen. The author calls attention to the part played by aphides and similar parasites in the production of saccharine liquids from plants, and includes the orange-tree among the cases of this kind.—Osteomyelitis of the inferior maxillary in the kangaroo, by MM. Lannelongue and Achard.—On the action of the toxine from the pyogenous Staphylococcus on the rabbit, and on the secondary infections which it determines, by MM. Mosny and G. Marcano. The toxine does not confer immunity against the attacks of the living microbe.—Action of high pressures on some bacteria, by M. H. Roger. Notable differences were observed between different bacteria in regard to their behaviour under pressure. The virulence of the anthrax bacillus was very much diminished by a pressure of 3000 kgms.—On the disinfection of fœcal matter, by M. H. Vincent. At about 16° C. the disinfection of normal fœcal substances is brought about in twenty-four hours by 6 kgms. of copper sulphate per cubic metre. Eberth's bacillus is destroyed in typhoidal refuse by 5 kgms. per cubic metre, and the cholera bacillus by 3·5 kgms. of copper sulphate per cubic metre after twelve hours contact.—Marine muds and their classification, by M. J. Thoulet.

BERLIN.

Physical Society, November 2.—Prof. du Bois Reymond, President, in the chair.—The President alluded to the death of Prof. Pringsheim, and drew attention to his important researches on the fertilisation of algæ.—Dr. C. H. Wind gave a comprehensive review of the researches carried on by Dutch observers with reference to Kerr's phenomenon. He then discussed Lorentz's theory, and described the elaborate experiments made by Sissingh and Zeeman and by himself, which had yielded results for iron, nickel, and cobalt, which were not quite in accord with the theory. Since the other theories as to this phenomenon, as, for instance, that of Drude, are still less in accord with experimental facts, the speaker had extended Lorentz's theory so as to take into account the results obtained by Sissingh and Zeeman, and to bring the phenomenon of Kerr into relation with that of Hall. This extension of the theory had been accepted by Lorentz, and Dr. Wind is now engaged on the investigation of certain phases of Hall's phenomenon.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—In the Guiana Forest: J. Rodway (Unwin).—The Electro-Plater's Handbook: G. E. Bonney, 2nd edition (Whittaker).—Lehrbuch der Botanik für Hochschulen: Drs. Strasburger, Noll, Schenck, and Schimper (Jena, Fischer).—Lehrbuch der Zoologie: Dr. R. Hertwig, Dritte Auflage (Jena, Fischer).—Climbing in the Himalayas; Maps and Scientific Reports: W. M. Conway (Unwin).—Ottica: Prof. E. Gelcich (Milano, Hoepli).—The Dynamics of Life: Dr. W. R. Gowers (Churchill).—The Planet Earth: R. A. Gregory (Macmillan).—Britain's Naval Power: H. Williams (Macmillan).—The Warwick Shakespeare. "As you like it," edited by J. C. Smith (Blackie).—The Teacher's Manual of Lessons in Elementary Science: H. Major (Blackie).—Handbuch der Stereochemie: Drs. Walden and Bischoff, ii. Band (Frankfurt a.M., Bechhold).—Forty-three Graphic Tables or Diagrams for the Conversion of Measurements in Different Units: Prof. R. H. Smith (Griffin).—Torpilles Sèches: E. Hennebert (Paris, Gauthier-Villars).

PAMPHLET.—Gehirn und Seele: Prof. A. Forel (Bonn, Strauss).

SERIALS.—Observatory, December (Taylor and Francis).—Companion to Observatory (Taylor and Francis).—Himmel und Erde, December (Berlin, Paetel).—Geographical Journal, December (Stanford).—Natural History of Plants: Kerner and Oliver, Part 8 (Blackie).—Yule Tide Annual (Cassell).—Science Progress, December (Scientific Press).

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